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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/989,777	11/19/2001	Craig Nemecek	CYPR-CD01208M	2046

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EXAMINER
SHARON, AYAL I

ART UNIT	PAPER NUMBER
2123	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/989,777	NEMECEK, CRAIG	
	Examiner	Art Unit	
	Ayal I. Sharon	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/12/05* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. Claims 1-28 of U.S. Application 09/989,777 are currently pending.
2. The application was originally filed on filed on 11/19/2001.
3. New prior art has been applied.

Continued Examination Under 37 CFR 1.114

4. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/13/2007 has been entered.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-6, 10-15, and 25-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s)

contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The independent claims 1, 10, and 25 have been amended in the amendment filed 6/13/07 to recite a "signal from an operating program", however, the Applicant has not provided any support in the specification for this amendment.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. The prior art used for these rejections is as follows:
   a. U.S. Patent 7,236,921 to Nemecek et al. (Henceforth referred to as **"Nemecek et al."**).
9. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.
10. **Claims 1-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Nemecek et al.**
11. In regards to Claim 1, Nemecek et al. teaches the following limitations:

1. A method for performing a sleep operation in a system that includes a device under test and an emulator device, said method comprising:

a) executing instructions on said device under test;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

b) emulating the functions of said device under test by operating said emulator device in lock-step fashion with said device under test; and

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

c) performing a sleep operation, comprising:

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

c1) upon receiving a first signal from an operating program that indicates that a sleep function is to be performed, initiating said sleep function at said device under test;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

c2) turning off one or more clock of said device under test; and

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

c3) discontinuing execution of instructions that are performed in lock-step by said emulator device upon turning off said clock.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

12. In regards to Claim 2, Nemecek et al. teaches the following limitations:

2. The method of Claim 1 wherein said clock comprises an internal CPU clock.

(See Nemecek et al., especially: col.17, lines 3-6)

13. In regards to Claim 3, Nemecek et al. teaches the following limitations:

3. The method of Claim 2 wherein said first signal is generated by said device under test and is transmitted internally to a register that indicates that a sleep function is to be performed.

(See Nemecek et al., especially: col.16, lines 41-44 and Item 716 in Figure 9.)

14. In regards to Claim 4, Nemecek et al. teaches the following limitations:

4. The method of Claim 1 further comprising:

when said sleep function has been completed by said device under test, turning on said clock and sending a second signal from said device under test to said emulator device;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

receiving said second signal at said emulator device;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

determining the number of clock signals received at said emulator device since said second signal was received; and

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

resuming execution of said instructions that are performed in lock-step at said emulator device when said determined number of clock signals received at said emulator device since said second signal was received equals a predetermined value.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

15. In regards to Claim 5, Nemecek et al. teaches the following limitations:

5. The method of Claim 4 wherein said device under test further comprises a microcontroller and wherein said first signal comprises a first bit, said first bit received at a register of said microcontroller to indicate that a sleep function is to be performed.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37; and col.11, lines 34-41)

16. In regards to Claim 6, Nemecek et al. teaches the following limitations:

6. The method of Claim 5 wherein said emulator device further comprises a Field Programmable Gate Array (FPGA) device.

(See Nemecek et al., especially: col.13, line 54 to col.14, line 3, and Fig.6, Item 220)

17. In regards to Claim 7, Nemecek et al. teaches the following limitations:

7. A method for performing a stall operation in a system that includes a device under test and an emulator device, said method comprising:

a) executing instructions on said device under test;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

b) emulating the functions of said device under test by operating said emulator device in lock-step fashion with said device under test; and

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

c) performing a stall operation, comprising:

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

c1) said device under test conveying clock signals to said emulator device;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

c2) upon receiving a first signal that indicates that a stall function is to be performed, initiating said stall function at said device under test;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

c3) upon receiving said first signal, discontinuing said sending of said clock signals from said device under test to said emulator device; and

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

c4) discontinuing execution of said instructions that are performed in lock-step at said emulator device while said sending of said clock signals is discontinued.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

18. In regards to Claim 8, Nemecek et al. teaches the following limitations:

8. The method according to claim 7 wherein said device under test is a microcontroller and wherein said emulator device includes a field programmable gate array (FPGA), said clock signals further comprising signals from said microcontroller central processing unit clock.

(See Nemecek et al., especially: col.13, line 54 to col.14, line 3, and Fig.6, Item 220)

19. In regards to Claim 9, Nemecek et al. teaches the following limitations:

9. The method of Claim 8 further comprising: resuming sending of said clock signals from said device under test to said emulator device when said stall function has been completed by said device under test, said emulator device operable upon receiving said clock signals to resume execution of said instructions that are performed in lock-step.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

20. In regards to Claim 10, Nemecek et al. teaches the following limitations:

10. A method for performing a sleep operation, comprising:

executing a sequence of instructions by a device under test, said device under test including at least one clock for generating clock signals;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

executing said sequence of instructions by an emulator device emulating the functions of said device under test, said emulator device executing said sequence of instructions in lock-step fashion with said device under test;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

receiving a first signal from an operating program at a register of said device under test that indicates that a sleep function is to be initiated;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

initiating said sleep function at said device under test upon receipt of said first signal;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

turning off said at least one clock of said device under test; and

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

discontinuing execution of instructions that are performed in lock-step by

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

said emulator device upon said turning off of said clock.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

21. In regards to Claim 11, Nemecek et al. teaches the following limitations:

11. The method according to claim 10 wherein said device under test is a microcontroller and wherein said emulator device includes a field programmable gate array (FPGA).

(See Nemecek et al., especially: col.13, line 54 to col.14, line 3, and Fig.6, Item 220)

22. In regards to Claim 12, Nemecek et al. teaches the following limitations:

12. The method of Claim 11 wherein said at least one clock includes a microcontroller CPU clock.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

23. In regards to Claim 13, Nemecek et al. teaches the following limitations:

13. The method of Claim 12 further comprising:

when said sleep function has been completed by said device under test, resuming generation of clock signals at said device under test and coupling said clock signals to said emulator device;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

when said sleep function has been completed by said device under test, sending a second signal from said device under test to said emulator device;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

receiving said second signal at said emulator device;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

determining the number of clock signals received at said emulator device since said second signal was received; and

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

resuming execution of said instructions that are performed in lock-step at said emulator device when said determined number of clock signals received at said emulator device since said second signal was received equals a predetermined value.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

24. In regards to Claim 14, Nemecek et al. teaches the following limitations:

14. The method according to claim 13 wherein said device under test is a microcontroller and wherein said emulator device includes a field programmable gate array (FPGA).

(See Nemecek et al., especially: col.13, line 54 to col.14, line 3, and Fig.6, Item 220)

25. In regards to Claim 15, Nemecek et al. teaches the following limitations:

15. The method of Claim 14 wherein said first signal is a first bit, said sleep function initiated upon the receipt of said first bit at a register of said microcontroller.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37; and col.11, lines 34-41)

26. In regards to Claim 16, Nemecek et al. teaches the following limitations:

16. A method for performing a stall operation, comprising:

executing a sequence of instructions by a device under test;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

executing said sequence of instructions by an emulator device emulating the functions of said device under test, said emulator device executing said sequence of instructions in lock-step fashion with said device under test;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

said device under test sending clock signals to said emulator device; receiving a first signal at a register of said device under test that indicates that a stall function is to be initiated;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

initiating said stall function at said device under test upon receipt of said first signal;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

discontinuing said sending of said clock signals from said device under test to said emulator device upon initiation of a stall function at said device under test; and

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

discontinuing execution of said sequence of instructions at said emulator device while said sending of said clock signals is discontinued.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

27. In regards to Claim 17, Nemecek et al. teaches the following limitations:

17. The method according to claim 16 wherein said device under test is a microcontroller and wherein said emulator device includes a field programmable gate array (FPGA).

(See Nemecek et al., especially: col.13, line 54 to col.14, line 3, and Fig.6, Item 220)

28. In regards to Claim 18, Nemecek et al. teaches the following limitations:

18. The method according to Claim 17 wherein said clock signals further comprise signals from a central processing unit clock of said microcontroller.

(See Nemecek et al., especially:)

29. In regards to Claim 19, Nemecek et al. teaches the following limitations:

19. The method of Claim 18 further comprising: resuming sending of said clock signals from said device under test to said emulator device when said stall function has been completed by said device under test, said emulator device operable upon receiving said clock signals to resume execution of said sequence of instructions.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

30. In regards to Claim 20, Nemecek et al. teaches the following limitations:

> 20. The method of Claim 19 wherein said sequence of instructions comprises the core processing functions of said microcontroller.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

31. In regards to Claim 21, Nemecek et al. teaches the following limitations:

> 21. An in-circuit emulation system comprising:
>
> a device under test that executes a sequence of instructions, said device under test operable, upon receiving a first signal, to initiate a stall function;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

> an emulator device for emulating the functions of said device under test, said emulator device operable so as to execute said sequence of instructions in lock-step fashion with said device under test, said emulator device configured for receiving clock signals sent by said device under test; and

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

> wherein said device under test sends clock signals to said emulator device, said device under test operable, upon receiving said first signal, to discontinue sending said clock signals to said emulator device, and said emulator device operable, upon said discontinuation of said clock signals from said device under test, to discontinue execution of said sequence of instructions.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

32. In regards to Claim 22, Nemecek et al. teaches the following limitations:

> 22. The in-circuit emulation system of Claim 21 wherein said device under test is a microcontroller, said microcontroller operable to resume sending said clock signals to said emulator device when said stall function has been completed by said microcontroller, said emulator device operable upon receiving said clock signals to resume execution of said sequence of instructions.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

33. In regards to Claim 23, Nemecek et al. teaches the following limitations:

> 23. The in-circuit emulation system of Claim 22 wherein said clock signals further comprise signals from a central processing unit clock of said microcontroller.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

34. In regards to Claim 24, Nemecek et al. teaches the following limitations:

> 24. The in-circuit emulation system of Claim 23 wherein said emulator device comprises a field programmable gate array (FPGA).

(See Nemecek et al., especially: col.13, line 54 to col.14, line 3, and Fig.6, Item 220)

35. In regards to Claim 25, Nemecek et al. teaches the following limitations:

> 25. An in-circuit emulation system comprising;

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

> a device under test that executes a sequence of instructions, said device under test operable, upon receiving a first signal from an operating program to initiate a sleep function at said device under test and to turn off a clock of said device under test; and

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

> an emulator device for emulating the functions of said device under test, said emulator device operable so as to execute said sequence of instructions in lock-step fashion with said device under test, said emulator device operable, upon said turning off of said clock to discontinue execution of said sequence of instructions at said emulator device.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

36. In regards to Claim 26, Nemecek et al. teaches the following limitations:

> 26. The in-circuit emulation system of Claim 25 wherein said device under test comprises a microcontroller, said device under test operable when said sleep function has been completed by said device under test to turn on said at least one clock and to send a second signal to said emulator device, said emulator device operable upon receiving said second signal to determine the number of clock signals received at said emulator device since said second signal was received and said emulator device operable to resume execution of said sequence of instructions when said determined number of clock signals received at said emulator device since said second signal was received equals a predetermined value.

(See Nemecek et al., especially:)

37. In regards to Claim 27, Nemecek et al. teaches the following limitations:

> 27. The in-circuit emulation system of Claim 26 wherein 22 device under test is a microcontroller, said at least one clock further comprising a central processing unit clock of said microcontroller.

(See Nemecek et al., especially: col.16, line 21 to col.17, line 37)

38. In regards to Claim 28, Nemecek et al. teaches the following limitations:

> 28. The in-circuit emulation system of Claim 27 wherein said emulator device comprises a field programmable gate array (FPGA).

(See Nemecek et al., especially: col.13, line 54 to col.14, line 3, and Fig.6, Item 220)

Response to Arguments

Re: Claim Rejections - 35 USC § 102

39. Examiner has replaced the previously applied prior art with U.S. Patent 7,236,921 to Nemecek et al. (This patent, like the previously applied prior art, is a different inventive entity than the instant application).

40. Examiner finds that the newly applied prior art teaches both the newly amended limitations, and also resolves the arguments raised by the Applicant (see pp.12-19 of the amendment filed 6/13/07) in regards to the previously applied prior art.

41. In regards to turning off clocks, the newly applied reference expressly teaches (see col.17, lines 3-6. Emphasis added): "The watchdog event further turns off the clocks 246 in microcontroller 232 at 832 so that the gatekeeper can determine from observing the clocks 246 that they are in the off state."

42. In regards to sleep mode, the newly applied reference expressly teaches (see col.16, lines 38-41. Emphasis added): "In the event microcontroller 232 is in a sleep mode, the gatekeeper sends a message to the host computer informing the host computer debug software of the sleep mode of microcontroller 232 at 712."

43. In regards to functioning in lock-step, the newly applied reference expressly teaches (see col.17, lines 18-24. Emphasis added): "The gate keeper then

reroutes the gatekeeper clock to the virtual microcontroller in place of the normal microcontroller clock (CCLOCK) using switch 616 at 848. This enables the virtual microcontroller 220 to continue operation under control of the debug software in host computer 210 so that debug operations can be carried out."

44. In regards to resuming execution of instructions after initiating sleep mode, the newly applied reference expressly teaches (see col.16, lines 43-46. Emphasis added): "In the case where microcontroller 232 is asleep, eventually a timed event will cause the microcontroller to awaken and when that event occurs at 720 the microcontroller is halted at 724." Examiner interprets that a "timed event" has corresponds to a predetermined number of clock cycles. Examiner also interprets that halting the microcontroller corresponds to "discontinuing the sending of clock signals."

Conclusion

45. The following prior art, made of record and not relied upon, is considered pertinent to applicant's disclosure.

46. U.S. Patent 7,162,410 to Nemecek et al. (A related patent to the patent applied in the art rejections).

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (571) 272-3714. The examiner can normally be reached on Monday through Thursday, and the first Friday of a biweek, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached at (571) 272-3753.

Any response to this office action should be faxed to (703) 872-9306, or mailed to:

USPTO
P.O. Box 1450
Alexandria, VA 22313-1450

or hand carried to:

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Randolph Building
401 Dulany Street
Alexandria, VA 22314

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center 2100 Receptionist, whose telephone number is (571) 272-2100.

Ayal I. Sharon
Art Unit 2123
August 29, 2007

PAUL RODRIGUEZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100